NUCLEAR WEAPON ACCIDENT RESPONSE PROCEDURES (NARP)

MANUAL

ASSISTANT TO THE SECRETARY OF DEFENSE (ATOMIC ENERGY)

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WASHINGTON, DC 20301-3050

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FOREWORD

This Manual has been developed by the Defense Nuclear Agency (DNA) under the authority of DoD Directive 5100.52, "DoD Response to an Accident or Significant Incident Involving Radioactive Material s," December 21, 1989, and supersedes DNA 5100.1, "Nuclear Weapon Accident Response procedures (NARP) Manual," January 1984.

This Manual applies to the Office of the Secretary of Defense (OSD) ; the Military Departments; the Chairman Joint Chiefs of Staff and Joint Staff; the Unified and Specified Commands; and the Defense Agencies and DoD Field Activities that support response to a nuclear weapon accident (hereafter referred to collectively as "DoD Components") . This Manual is effective immediately.

The purpose of this Manual is to provide the On-Scene Commander and his or her planning staff with a single, comprehensive document that summarizes procedural guidance, technical information, and DoD responsibilities for responding to an accident involving nuclear weapons. The NARP also describes the substantial resources in other Federal Agencies that can be made available to assist in the response effort.

This Manual should be widely disseminated and made available to all commanders and staff who may be called upon to respond to a nuclear weapon accident. It should serve as a guide for more detailed planning for nuclear weapon accident response, and can be used to improve training and exercise programs.

Suggestions to update or improve this Manual are solicited. Send proposed changes through appropriate channels to:

Headquarters, Defense Nuclear Agency
Attn: NOEA
6801 Telegraph Road
Alexandria, VA 22310-3398

DoD Components may obtain copies of this Manual through their own publications channels. Other Federal Agencies and the public may obtain copies from the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

/s/ Robert B. Barker

Robert B. Barker

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ACRONYMS

AAC	Ambient Air Concentration
AF	Air Force
AFB	Air Force Base
AFOC	Air Force Operations Center
AFRAT	Air Force Radiation Assessment Team
AFRRI	Armed Forces Radiobiology Research Institute'
AMS	Aerial Measurement System
AOC	Army Operations Center
ARAC	Atmospheric Release Advisory Capability
ARG	Accident Response Group
ASD(PA)	Assistant Secretary of Defense (Public Affairs)
ATRAP	Air Transportable RADIAC Package
ATSD(AE)	Assistant to the Secretary of Defense (Atomic Energy)
AUTODIN	Automatic Digital Network
AUTOSEVOCOM	Automatic Secure Voice Communications Network
AUTOVON	Automatic Voice Network
Bq	Becquerel
CAT	Crisis Action Team
CCA	Contamination Control Area
c c c	Crisis Coordination Center
CCG	Combat Communications Group
C c s	Contamination Control Station
CDCE	Contamination Disposal Coordinating Element
CDRH	Center for Devices and Radiological Health
CEAT	Community Emergency Action Team
CEOI	Communications Electronic Operating Instruction
CF	Composite Fiber
CINC	Commander-in-Chief
CNWDI	Critical Nuclear Weapon Design Information
COM	Chief of Mission
COMSEC	Communications Security
CP	Command Post
CPM	Counts Per Minute
CPX	Command Post Exercise
DCE	Disaster Control Element
DCO	Disaster Control Officer
DCS	Defense Communications System
DHHS	Department of Health and Human Services
DNA	Defense Nuclear Agency
DNAAT	Defense Nuclear Agency Advisory Team
DoC	Department of Commerce
DoD	Department of Defense
DoE	Department of Energy
DoE/AL	Department of Energy/Albuquerque Operations
DoE/NV	Department of Energy/Nevada Operations
DoI	Department of the Interior
DOMS	Director of Military 'Support '
DoS	Department of State

DoT	Department of Transportation
DPM/ m3	Disintegrations Per Minute Per Cubic Meter
DRF	Disaster Response Force
DSFO	Deputy Senior FEMA Official
EAC	Emergency Action Committee
ECS	Exercise Control Staff
EEFI	Essential Elements of Friendly Information
EICC	Emergency Information and Coordination Center (FEMA)
EMR	Electro-Magnetic Radiation
EMT	Emergency Medical Team
EOC	Emergency Operations Center
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
ERT	Emergency Response Team
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FCDNA	Field Command, Defense Nuclear Agency
FCO	Federal Coordinating Officer
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FONAC	Flag Officers' Nuclear Accident Course
FRC	Federal Response Center
FRERP	Federal Radiological Emergency Response Plan
FRMAC	Federal Radiological Monitoring and Assessment Center
FRMAP	Federal Radiological Monitoring and Assessment Plan
FTS	Federal Telecommunications System
FTX	Field Training Exercise
GMF	Ground Mobile Force
GSA	General Services Administration
HE	High Explosive
HEPA	High Efficiency Particle Air
HF	High Frequency
HHS	Department of Health and Human Services
HDNA	Headquarters, Defense Nuclear Agency
HOT SPOT	Department of Energy Mobile Counting Laboratory
HUD	Department of Housing and Urban Development
IC	Inhaled Concentration
ICC	Interstate Commerce Commission
IND	Improvised Nuclear Device
INWS	Interservice Nuclear Weapons School
IRF	Initial Response Force
JA	Judge Advocate
JACC/ CP	Joint Airborne Communications Center) Command Post
JCS	Joint Chiefs of Staff
JCSE	Joint Communications Support Element
JHEC	Joint Hazard Evaluation Center
JIC	Joint Information Center
JNACC	Joint Nuclear Accident Coordinating Center

JS	Joint Staff
JSCP	Joint Strategic Capability Plan
keV	Thousand Electron Volts
LOS	Limit of Sensitivity
MAC	Military Airlift Command
MARD	Mobile Accident Response Development
MeV	Million Electron Volts
MILSTRIP	Military Standard Requisitioning and Issue Procedures
MPC	Maximum Permissible Concentration
MRAT	Medical Radiobiology Advisory Team
MRT	Medical Radiology Team
NAIR	Nuclear Accident Incident Response
NARCL	Nuclear Accident Response Capability Listing
NARP	Nuclear Weapon Accident Response Procedures Manual
NASA	National Aeronautics and Space Administration
NAVMED	Navy Bureau of Medicine and Surgery
NCA	National Command Authority
NCAIC	Nuclear Chemical Accident/ Incident Control
NCC	National Coordinating Center
NCC	Navy Command Center
NCS	National Communications System
NDA	National Defense Area
NESDIS	National Environmental Satellite Data and Information Service
NEST	Nuclear Emergency Search Team
NMCC	National Military Command Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NRC	Nuclear Regulatory Commission
NSA	National Security Area
NSC	National Security Council
NSN	National Stock Number
NTS	Nevada Test Site
NTSB	National Transportation Safety Board
NUWAX	Nuclear Weapon Accident Exercise
NWS	National Weather Service
OAR	Office of Oceanic and Atmospheric Research
OASD(PA)	Office of the Assistant Secretary of Defense (Public Affairs)
OEHL	Occupational and Environmental Health Laboratory
OEMT	Operational Emergency Management Team
O s c	On-Scene Commander
PAG	Protective Action Guide
PAO	Public Affairs Officer
PAR	Protective Action Recommendation
PLA	Principal Legal Advisor
PRP	Personnel Reliability Program
QD	Quantity Distance
R	Roentgen
RADCON	Radiological Control
RAMT	Radiological Advisory Medical Team

RAP	Radiological Assistance Program (DoE)
RCA	Radiological Control Area
RCL	Radiological Control Line
REAC/TS	Radiation Emergency Assistance Center/Training Site
RER	Re-entry Recommendations
RRF	Regional Response Force
RSP	Render Safe Procedures
SAAM	Special Assignments Airlift Mission
SCBA	Self Contained Breathing Apparatus
SECORD	Secure Cord Switchboard
SENAC	Senior Executive Nuclear Accident Course
SFO	Senior FEMA Official
SONAC	Senior Officers' Nuclear Accident Course
SRF	Service Response Force
SRP	Site Restoration Plan
SSN or SSAN	Social Security Number
TELEX	Telephone Exchange
TWX	Teletypewriter Exchange
uCi/ m^3	Microcuries per cubic meter
UHF	Ultra High Frequency
u s	United States
USCINC	U.S. Commander-in-Chief
USDA	U.S. Department of Agriculture
USFORSCOM	U.S. Army Forces Command
USMC	U.S. Marine Corps
VHF	Very High Frequency
WATS	Wide Area Telephone Service

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DEFINITIONS

Access Procedures. See Explosive Ordnance Disposal Procedures.

Accident Response Group **(ARG).** The Department of Energy (DoE) Accident Response Group consists of qualified scientific, medical, and technical personnel and specialized equipment designated to execute DoE's response operations upon notification of a nuclear weapon accident/incident.

Aerial Measurement System **(AMS).** Performs aerial measurements of ground and airborne radioactivity over large areas by utilizing instrumentation for detecting and recording gamma radiation, both as gross count rates and gamma energy spectra. Equipment for determining the position of the aircraft is integrated into the system.

Airborne Radioactivity. Any radioactive material suspended in the atmosphere.

Air Force Radiation Assessment Team **(AFRAT).** A field qualified team of health physicists and health physics technicians established at the USAF Occupational and Environmental Health Laboratory (USAF OEHL). The team is capable of responding worldwide with air transportable equipment to radiation accidents/ incidents, providing on-site health physics consultation and instrumentation for the detection. identification, and quantification of any possible radiation hazard.

Air Sampler. - A device used to collect a sample of the radioactive particulate suspended in the air.

Air Transportable RADIAC Package (ATRAP). A collection of RADIAC equipment, spare parts, and trained instrument repair technicians maintained in an alert status by the Air Force Logistics Command for airlift to the scene of a nuclear weapon accident/incident to supplement the local RADIAC equipment and repair capability.

Alpha Team. An Army team possessing an alpha radiation monitoring capability. The team is identified usually as part of a Nuclear Accident and Incident Control (NAIC) Team.

Anti-Contamination Clothing (Anti-C's). Clothing consisting of coveralls, shoe covers, gloves, and hood or hair cap. Anti-contamination clothing provides protection for the user from alpha radiation, and is also a control device to prevent the spread of contamination. A respirator can be worn with the anti-contamination clothing which provides protection against the inhalation of contaminants.

Armed. The configuration of a nuclear weapon in which a single signal initiates the action for a nuclear detonation.

Atmospheric Release Advisory Capability **(ARAC).** A DoE asset capable of providing a computer generated model of the most probable path of the radioactive contamination released at an accident site.

Background Count. (In connection with health protection). The background count includes radiation produced by naturally occurring radioactivity and cosmic rays.

Background Radiation. Radiation arising from radioactive material other than the one under consideration. Background radiation due to cosmic rays and natural radioactivity is always present.

Becquerel. The unit of activity of a radionuclide, equal to the activity of a quantity of a radionuclide having one spontaneous nuclear transition per second. Symbolized Bq.

BENT SPEAR. A term used in the DoD to identify and report a nuclear incident involving a nuclear weapon/ warhead or nuclear component. In the Army and Air Force, this term includes a "significant incident" as defined in DoD Directive 5100.52. See nuclear weapon incident,

Bioassay. The method(s) for determining the amount of internal contamination received by an individual.

BROKEN ARROW. A DoD term to identify and report an accident involving a nuclear weapon/warhead or nuclear component. In the Navy this includes a "significant incident" as defined in DoD Directive 5100.52. See nuclear weapon(s) accident.

Cognizant Agency Authority or Official. The foreign government agency, official or the senior representative

of the involved country's government at an accident/ incident site.

Community Emergency Action Team **(CEAT).** A team of response and local experts that operates out of the JIC and is available to assist the local community.

Cognizant Federal Agency **(CFA).The** Cognizant Federal Agency is that Federal agency having custody of the weapon at the time of the accident. The CFA is responsible to:

a. Conduct and manage Federal on-site actions.

b. Develop or evaluate recommendations for public protective action measures off site.

c. Present recommendations for off-site protective action measures, in coordination with FEMA, to the appropriate State and /or local officials or Foreign government.

d. Coordinate initially the release of information to the public, Congress, and the White House until transferred to FEMA by mutual agreement.

Contamination. The deposit and/ or absorption of radioactive material, biological, or chemical agents or hazardous materials on, and by, structures, areas, personnel, or objects.

Contamination Control. Procedures to avoid, reduce, remove, or render harmless, temporarily or permanently, nuclear, biological, chemical agent and hazardous materials contamination.

Contamination Control Line (CCL). A control line surrounding the radiological control area. Initially, the contamination control line extends 100 meters beyond the known/ suspected radiological contamination to provide a measure of safety. Once the contamination control station is operational, this line is the outer boundary that separates the reduced hazard area from the clean area.

Contamination Control Station **(CCS).** An area (tent or facility) specifically designated for controlling ingress and egress of personnel and equipment to/from the radiation control area. The outer boundary of the Contamination Control Station is the contamination control line, and the inner boundary is the line segment labeled the hot line. An illustration of the Contamination Control Station is at Chapter 5.

Critical Nuclear Weapon Design Information' **(CNWDI).** TOP SECRET RESTRICTED DATA or SECRET RESTRICTED DATA revealing the theory of operation or design of the components of a thermonuclear or implosion-type fission bomb, warhead, demolition munition, or test device. Specifically excluded is information concerning arming, fusing, and firing systems, limited life components, and totally contained quantities of fissionable, fissionable, and high explosive materials by type. Among excluded items are the components which Service personnel set, maintain, operate, test, or replace.

Contamination Reduction Area **(CRA).** The area concept is employed at the Contamination Control Station to eliminate (or reduce to an acceptable level) contamination adhering to personnel in the contaminated area. The concept uses supervised, structured, and meticulous clothing/ equipment removal procedures precluding mechanical transfer of contamination on a person/ object and outside the Contamination Control Station.

Cumulative Dose (Radiation). The total dose resulting from repeated exposure to radiation in the same region, or of the whole body.

Custody. Responsibility for the control of, transfer and movement of, and access to, weapons and components. Also custody includes the maintenance of weapons and components.

Decay (Radioactive). The decrease in the radiation intensity of any radioactive material with respect to time.

Decontamination. The process of making any person, object, or area safe by absorbing, destroying, neutralizing, making harmless, or removing hazardous materials clinging to or around it.

Decontamination Station. A building or location equipped and organized to cleanse personnel and material of chemical, biological, or radiological contaminants.

Department of Defense Executive Agent. One who acts on behalf of the Secretary of Defense with his authority over the military services and DoD agencies. For military assistance to disaster relief operations, the Secretary of the Army is the DoD Executive Agent.

Department of Energy Team Leader. The coordinator of all Department of Energy matters, both off and

on-site, including Department of Energy Accident Response Group operations.

Directorate of Military Support **(DOMS).** Action agency for the Secretary of the Army when acting in the capacity of DoD Executive Agent. Directs a task-organized joint staff formed to support the planning, coordination, and execution of military support to domestic disaster relief operations.

Disaster Control. Measures taken before, during, or after hostile action, natural or man-made disasters, to reduce the probability of damage, minimize its effects, and initiate recovery.

Disaster Control Officer **(DCO).** The DCO is the DoD point of contact with FEMA at the disaster scene for providing DoD support to disaster recovery operations.

Disaster Cordon. A physical barrier surrounding the accident scene where control is established to preclude unauthorized entry.

Disaster Preparedness. That series of actions to control and manage nuclear incidents or accidents and bring them to a practicable conclusion within the established security, response and recovery framework. These actions include initial and subsequent reporting response, Explosive Ordnance Disposal procedural action on the weapon(s), appropriate security, legal and medical aspects, public information, and control of hazards caused by the accident. Control of the accident caused hazards include: survey of the incident/accident area to establish isodose lines and all types of monitoring; personnel and area decontamination; disposition of nuclear, high explosive, and contaminated items.

Disaster Response **Force (DRF).** The USAF base level organization which responds to disasters/accidents for establishing command and control, and to support disaster operations.

Dose Rate Contour Line. A line on a map, diagram, or overlay joining all points at which the radiation dose rate at a given time is the same.

Dosimetry. The measurement of radiation doses as it applies to both the devices used (dosimeters) and to the techniques.

Exclusion Area. Any designated area containing one or more nuclear weapons or components.

Explosive Ordnance. All munitions containing explosives, nuclear fission, or fusion materials and biological and chemical agents. This ordnance includes bombs and warheads, guided and ballistic missiles; artillery, mortar, rocket, and small arms ammunition. Also, ordnance includes all mines, torpedoes, and depth charges; pyrotechnics; clusters and dispensers; cartridges and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature.

Explosive Ordnance Disposal (EOD). The detection, identification, field evaluation, rendering-safe, and/ or disposal of explosive ordnance which has become hazardous by damage or deterioration when the disposal of such explosive ordnance is beyond the capabilities of personnel assigned to routine disposal.

Explosive Ordnance Disposal Incident. The suspected or detected presence of unexploded ordnance, or damaged explosive ordnance, which constitutes a hazard to operations, installation, personnel, or material. Not included in this definition are the accidental arming *or* other conditions that develop during the manufacture of high explosive material, technical service assembly operations, or the laying of mines and demolition charges.

Explosive Ordnance Disposal Procedures. Those particular courses or modes of action for access to, recovery, rendering-safe, and final disposal of explosive ordnance or any hazardous material associated with an explosive ordnance disposal incident.

a. Access Procedures. Those actions to locate exactly and to gain access to unexploded ordnance.

b. Recovery Procedures. Those actions to recover unexploded ordnance.

c. Render Safe Procedures. The portion of the explosive ordnance disposal procedures involving the application of special explosive ordnance disposal methods. and tools to provide the interruption of functions or separation of essential components of unexploded ordnance to prevent an unacceptable detonation.

d. Final Disposal Procedures. The final disposal of explosive ordnance by explosive ordnance disposal personnel, which may include demolition or burning in place, removal to a disposal area, or other appropriate means.

Explosive Ordnance Disposal Unit. Personnel with special training and equipment who render explosive ordnance (such as bombs, mines, projectiles, and booby traps) safe, make intelligence reports on such ordnance, and supervise the safe removal thereof.

Explosive Ordnance Reconnaissance. Reconnaissance involving the investigation, detection, location, marking, initial identification, and reporting of suspected unexploded ordnance, by explosive ordnance reconnaissance agents, to determine further action.

Exposure. The exposure at a given point is a measurement of radiation in relation to its ability to produce ionization.

Federal Coordinating Officer (FCO). The Federal official appointed by the President upon declaration of a major disaster or emergency under Public Law 93-288 to coordinate the overall Federal response.

Federal Emergency Management Agency (FEMA). This agency establishes Federal policies for and coordinates all civil defense and civil emergency planning, management, mitigation, and assistance functions of executive agencies, FEMA assists local and state agencies in their emergency planning. Its primary role in a nuclear weapon accident is one of coordinating Federal, state, local, and volunteer response actions.

a. Emergency Information and Coordination Center (EICC) - The EICC is located in FEMA Headquarters in Washington, DC and provides overall direction, control and coordination of Federal and state emergency services response/ recovery to a radiological accident or emergency.

b. Emergency Response Team (ERT) - The FEMA team deployed to a radiological emergency scene by the FEMA Director to make an initial assessment of the situation and then provide FEMA's primary response capability.

c. Emergency Support Team (EST) - The FEMA headquarters team that carries out notification activation and coordination procedures from the FEMA EICC. The EST is responsible for Federal agency headquarters coordination, staff support of the FEMA Director, and support of the SFO.

Federal Radiological Emergency Response Plan **(FRERP).** The Federal plan to assist State and local government officials or other Federal agencies in the response to a radiological emergency in the U. S., its possessions and territories.

Federal Radiological Monitoring and Assessment Center (FRMAC). A center established near the scene of a radiological emergency responsible for off-site radiological response from which the FRMAC Director conducts the FRMAP response. This center need not be located near the on-site or Federal-State operations centers as long as its operations can be coordinated with them. Staffed by DoE NV.

Federal Radiological Monitoring and Assessment Plan (FRMAP). A plan to provide coordinated radiological monitoring and assessment assistance to the State and local governments in response to radiological emergencies. This plan, authorized by 44 CFR Part 351, supersedes the Interagency Radiological Assistance Plan.

Federal Response Center (FRC). The on-site focal point established by the Senior FEMA Official (SFO), as required, for coordinating the Federal response to a nuclear weapon accident or significant incident. Representatives of other Federal, state, local, and volunteer agencies will be located in the center.

FIDLER (Field Instrument for the Detection of Low Energy Radiation). A probe, used with the PRM-5 and other supporting instrument packages, capable of detecting low energy gamma and X-rays.

Film Badge. A photographic film packet or badge carried by personnel, for measuring and recording gamma ray dosage permanently.

Final Disposal Procedures. See Explosive Ordnance Disposal Procedures.

Formerly Restricted Data **(FRD).** Information removed from the Restricted Data category upon determination jointly by the Department of Energy and Department of Defense that such information relates primarily to the military utilization of atomic weapons and that such information can be safeguarded adequately as national security information (Section 142d, Atomic Energy Act of 1954, as amended).

Hazardous Materials. Any material that is flammable, corrosive, an oxidizing agent, explosive, toxic, poisonous, etiological, radioactive, nuclear, unduly magnetic, a chemical agent, biological research material, compressed gases, or any other material that, because of

its quantity, properties, or packaging, may endanger human life or property.

Half-Life. The time required for the activity of a given radioactive species to decrease to half of its initial value due to radioactive decay. The half-life is a characteristic property of each radioactive species and is independent of its amount or condition. The effective half-life of a given isotope in the body is the time in which the quantity in the body will decrease to half as a result of both radioactive decay and biological elimination.

Initial Response Force (IRF). An element, whose capabilities are listed in the Nuclear Accident Response Capabilities Listing. (NARCL), belonging to DoD or DoE installations, facilities, or activities, which would take emergency response actions necessary to maintain command and control on-site pending arrival of the Service or agency response force. Functions which the initial response force is tasked to perform (within its capabilities), are:

a. Rescue operations.

b. Accident site security.

c. Firefighting.

d. Initiation of appropriate EOD procedures.

e. Radiation monitoring.

f. Establishment of. command, control, and communications.

g. Public "affairs activities.

Improvised Nuclear Device (IND) Incident. Is an event resulting from a deliberate act, involving nuclear weapons or nuclear materials which include the sabotage, seizure, theft, or loss of a nuclear weapon or radiological nuclear weapon component or the fabrication and employment of an IND or a credible threat of either.

Ingestion Pathway. The means by which a person is exposed to radiation through the food chain.

Inhalation Pathway. The means by which a person at the accident area or downwind is subjected to respiratory radiation exposure.

Hot Line. The Hot Line is the inner boundary of the contamination control station, marked with tape or line. The station personnel use the line as the inner side being contaminated and the side away from the accident as an area of reduced contamination.

Hot Spot. The region in a contaminated area in which the level of radioactive contamination is considerably greater than in neighboring regions in the area. "HOT SPOT" also refers to the DoE Accident Mobile Counting Laboratory and Mobile Support Equipment.

Joint Communications Support Element (JCSE). A communications element that provides high frequency, very high frequency, secure and super high frequency satellite terminals and other equipment.

Joint Communications Contingency Station Assets. The communications station provides high frequency radio, tropospheric scatter terminals, automatic digital network terminals, manual secure voice and other equipment.

Joint Information Center (JIC). A facility at the scene of a nuclear weapon accident or significant incident to coordinate all public affairs. The JIC includes representation from DoE, DoD, FEMA, DoS, and other Federal agencies, as well as state, local, and/or foreign governments.

Joint Nuclear Accident Coordinating Center (JNACC). The DoD and DoE operate coordinating centers for exchanging and maintaining information about radiological assistance capabilities and activities. These centers are separated geographically, but linked by direct communications networks.

Joint Hazard Evaluation Center **(JHEC).** A facility, staffed by representatives from each of the agencies conducting hazard survey and radiological operations, for the coordination of hazard survey data and radiological safety/health physics matters on-site.

Licensed Material. Source material, special nuclear material, or by product material received, possessed, used, or transferred under a general or specific license issued by the Nuclear Regulatory Commission or a state.

Maximum Permissible Dose. That radiation dose which a military commander or other appropriate authority may prescribe as the limiting cumulative radiation dose to be received over a specific period of time by members of the command, consistent with operational military considerations.

, **Monitoring.** The act of detecting the presence of radiation and the measurement thereof with radiation measuring instruments.

Nuclear Accident Response Capabilities Listing (NARCL). A listing of DoD and DoE installations, facilities, or activities with nuclear accident/incident response and radiation detection capabilities.

National Defense Area (NDA). An area established on non-Federal lands located within the United States, its possessions or territories, for the purpose of safeguarding classified defense information, or protecting DoD equipment and /or material. Establishment of a National Defense Area temporarily places such non-Federal lands under the effective control of the DoD and results only from an emergency event. The senior DoD representative at the scene will define the boundary, mark it with a physical barrier, and post warning signs. The landowner's consent and cooperation will be obtained whenever possible; however, military necessity will dictate the final decision regarding location, shape, and size of the NDA.

National Security Area (NSA). An area established on non-Federal lands located within the United States, its possessions, or territories, for safeguarding classified and /or restricted data information, or protecting DoE equipment and/ or material. Establishment of an NSA temporarily places such non-Federal lands under the control of the DoE and results only from an emergency event. The senior DoE representative having custody of the material at the scene will define the boundary, mark it with a physical barrier, and post warning signs. The landowner's consent and cooperation will be obtained whenever possible; however, operational necessity will dictate the final decision regarding location, shape, and size.

Need-to-Know. A criterion in security procedures which requires the custodians of classified information to establish, prior to disclosure, that the intended recipient must have access to the information to perform his official duties.

Nuclear Accident and Incident Control Team (NAIC). An Army team organized to minimize and prevent the loss of life, personal injury, hazardous effects, and destruction of property, to secure classified material, and to enhance and maintain the public's confidence in the Army's ability to respond effectively to a nuclear accident or incident.

Nuclear Contribution. Explosive energy released by nuclear fission or fusion reactions, as part of the total energy released by the accidental explosion of a nuclear weapon. Any nuclear contribution equivalent to four or more pounds of TNT is considered significant, and would add beta and gamma radiation hazards to other radiological and toxic hazards present at a nuclear weapon accident site.

Nuclear Detonation. A nuclear explosion resulting from fission or fusion reactions in nuclear materials, such as from a nuclear weapon.

Nuclear Radiation. Particulate and electromagnetic radiation emitted from atomic nuclei in various nuclear processes. The important nuclear radiations, from the weapons standpoint, are alpha and beta particles, gamma rays, and neutrons. All nuclear radiations are ionizing radiations, but the converse is not true.

Nuclear Emergency Search Team (NEST). The NEST is a DoE asset with specialized equipment for conducting radiation survey and detection, field communications, EOD support, bomb/weapon diagnostics, hazard prediction, damage mitigation, and decontamination.

Nuclear **Safing.** The prevention of a nuclear yield in the event of accidental detonation of the HE of a high explosive assembly weapon or ignition of the propellant of a gun assembly weapon.

Nuclear Weapon. A device in which the explosion results from the energy released by reaction involving atomic nuclei, either fission or fusion, or both.

Nuclear Weapon Accident. An unexpected event involving nuclear weapons or nuclear components that results in any of the following:

a. Accidental or unauthorized launching, firing, or use by U.S. forces or U.S. supported allied forces of a nuclear capable weapons system.

b. An accidental, unauthorized, or unexplained nuclear detonation.

c. Non-nuclear detonation or burning of a nuclear weapon or nuclear component.

d. Radioactive contamination.

e. Jettisoning of a nuclear weapon "or nuclear component.

f. Public hazard, actual or perceived.

Nuclear Weapon Incident. An unexpected event **involving a nuclear weapon,** facility, or component

resulting in any of the following, but not constituting a nuclear weapon(s) accident:

a. An increase in the possibility of explosion or radioactive contamination.

b. Errors committed in the assembly, testing, loading, or transportation of equipment, and/or the malfunctioning of equipment and material which could lead to an unintentional operation of all or part of the weapon arming and /or firing sequence, or which could lead to a substantial change in yield, or increased dud probability.

c. Any act of God, unfavorable environment, or condition resulting in damage to a weapon, facility, or component.

Nuclear Weapon Significant Incident. An unexpected event involving nuclear weapons or nuclear weapon components or a nuclear weapon transport or launch vehicle when a nuclear weapon is mated, loaded, or on board that does not fall in the nuclear weapon accident category but:

a. Results in evident damage to a nuclear weapon or radiological nuclear weapon component to the extent that major rework, complete replacement, or examination or recertification by the DoE is required.

b. Requires immediate action in the interest of safety or nuclear weapons security.

c. May result in adverse public reaction (national or international) or inadvertent release of classified information.

d. Could lead to a nuclear weapon accident and warrants that senior national officials or agencies be informed or take action.

Nuclear Yield. The energy released in the detonation of a nuclear weapon, measured in terms of the kilotons or megatons of trinitrotoluene (TNT) required to produce an equivalent energy release.

Occupational and Environmental Health Laboratory (OEHL). A USAF unit that provides consultant, engineering, and analytical support in radiological, occupational, and environmental health programs. The USAF unit offers a multitude of technical services on radiological problems. The radiological field unit of the OEHL is called the AFRAT.

Off-Site. That area beyond the boundaries of a DoD installation or DoE facility, including the area beyond the boundary of an NDA or NSA, that has been, or may become affected by a nuclear weapon accident or significant incident.

One-Point Detonation. A detonation of HE (High **Explosives) initiated at a single point.**

One-Point Safe. The criterion for design safety that a weapon must have less than one chance in a million of producing a nuclear yield of more than four pounds of TNT (equivalent energy release) when the high explosive is initiated and detonated at any single point.

On-Scene Commander **(OSC).** The Flag or General Officer designated to command the DoD response efforts at the accident site.

On-Site. That area around the scene of a nuclear weapon accident or significant incident under the operational control of the installation commander, facility manager, DoD OSC, or DoE team leader. The on-site area includes any area which has been established as a NDA or NSA.

Operational Emergency Management Team **(OEMT).** The DoE senior management team at headquarters that coordinates the initial FRMAP response to radiological emergencies.

Oralloy. Enriched uranium. One of the primary fissionable materials in nuclear weapons.

Particulate Radiation. Radiation in the form of particles (for example, neutrons, electrons, alpha and beta particles) as opposed to electromagnetic radiation.

Personnel Reliability Program **(PRP).** A DoD program implemented for all personnel who control, handle, have access to, or control access to nuclear weapon systems. The program covers selection, screening, and continuous evaluation of the personnel assigned to various nuclear duties. The program seeks to ensure that personnel coming under its purview are mentally and emotionally stable and reliable.

Physical **Security. That part of security concerned with physical measures designed to safeguard personnel, to prevent unauthorized access to equipment, facilities, material, and documents, and to safeguard them against espionage, sabotage, damage, and theft.**

Plutonium (Pu). An artificially produced fissile material. The Pu-239 isotope is primarily used in nuclear weapons.

Protective Action Guide **(PAG).** A radiation exposure level or range established by appropriate Federal or State agencies beyond which protective action should be considered.

Protective Action Recommendation (PAR). Advice to the State" on emergency measures it should consider in determining action for the public to take, avoid, or reduce exposure to radiation.

Quantity/Distance (QD) Safety Standards. Directives pertaining to the amounts and kinds of explosives that can be stored and the proximity of such storage to buildings, highways, railways, magazines, and other installations.

RAD. Old unit of absorbed dose radiation. One rad represents the absorption of 0.01 joule of nuclear (or ionizing) radiation energy per kilogram of the absorbing material or tissue.

RADIAC. A term designating various types of radiological measuring instruments or equipment. (This term is derived from the words "radioactivity detection, indication and computation," and is normally an adjective.

Radioactivity. The spontaneous emission of radiation, generally alpha or beta particles, often accompanied by gamma rays from the nuclei of an unstable isotope.

Radiation Emergency Assistance Center Training Site **(REAC/TS).** A treatment and consultative team for radiation emergencies, which provides training courses, at Oak Ridge, Tennessee.

Radiological Advisory Medical Team (RAMT). A special team established at Walter Reed Army Medical Center under the Commander, U.S. Army Health Services Command, available to the OSC, Nuclear Accident and Incident Control Officer, or Commander of a military hospital. Team personnel will advise on radiological health hazards and exposure level criteria.

Radiological "Assistance. That assistance provided after an accident involving radioactive materials to:

a. Evaluate the radiological hazard.

b. Accomplish emergency rescue and first aid.

c. Minimize safety hazards to the public.

d. Minimize exposure of personnel to radiation or radioactive material.

e. Minimize the spread of radioactive contamination.

f. Minimize damaging effects on property.

g. Disseminate technical information and medical advice to appropriate authorities.

Radiological Assistance Program Team (RAP Team). DoE teams available through DoE regional offices to assist in radiological emergencies.

Radiological Control Area (RCA). The control area encompassing all known, or suspected, radiological contamination at a nuclear weapon accident.

Radiological Control (RADCON) Team. Special radiological teams of the U.S. Army and U.S. Navy organized to provide technical assistance and advice in radiological emergencies.

Radiological Survey. The directed effort to determine the distribution of radiological material and dose rates in an area.

Re-entry Recommendations (RERs). Advice provided to the State concerning guidance that may be issued to members of the public on returning to an area affected by a radiological emergency, either permanently or for short-term emergency actions.

Recovery Procedures. See Explosive Ordnance Disposal Procedures.

Render Safe Procedures. See Explosive Ordnance Disposal Procedures.

Residual Contamination. Contamination which remains after steps have been taken to remove it. These steps may consist of nothing more than allowing the contamination to decay naturally.

Restricted Data **(RD).** All data (information) concerning.

a." Design, manufacture, or utilization of nuclear weapons.

b. Production of special nuclear material,

c. Special nuclear material in the production of energy but shall not include data declassified or removed from the restricted data category pursuant to Section 142 of the Atomic Energy Act (Section 11 W, Atomic Energy Act of 1954, as amended).

Roentgen. A obsolete unit of exposure of gamma (or X-ray) radiation in field dosimetry. One roentgen is essentially equal to one **rad**.

Roentgen Equivalent Man/Mammal (rem). One rem is the quantity of ionizing radiation of any type which, when absorbed by man or other mammals, produces a physiological effect equivalent to that produced by the absorption of one (1) roentgen of X-ray or gamma radiation. The S1 unit replaced the rem.

Safing. As applied to weapons and ammunition, the changing from a state of readiness for initiation to a safe condition.

Security Area. The area surrounding the accident site in an overseas country where a two-person security policy is established to prevent unauthorized access to classified defense information, equipment or material. The cooperation by local authorities and host countries consent should be obtained prior through host nation agreements.

Senior FEMA Official (SFO). A person appointed by the Director of FEMA to coordinate the Federal response to a civil emergency.

Service Response Force (SRF). A DoD response force appropriately manned, equipped, and able to perform and coordinate all actions necessary to control and recover from an accident or significant incident. The specific purpose of a Service/agency response force is to provide nuclear weapon accident/significant incident assistance. Service/ agency response forces are organized and maintained by those Services or agencies which have custody of nuclear weapons or radioactive nuclear "weapon components. "

Transuranic. Having an atomic number greater than that of uranium (The known elements belonging to the actinide series).

Tritium. Tritium is a radioactive isotope of hydrogen having one proton and two neutrons in the nucleus. Tritium is a beta emitter.

Tuballoy (TU). A term, of British origin, for uranium metal containing U-238 and U-235 in natural proportions, therefore, the term is considered ambiguous and its use is discouraged. This term is sometimes applied to depleted uranium. See uranium.

Two-Person Policy. A system designed to prohibit access by an individual to nuclear weapons and certain designated components by requiring the presence at all times of at least two authorized *persons capable* of detecting incorrect or unauthorized procedures with respect to "the task to be performed. Also referred to as the two-man concept or policy.

Uranium. Uranium is a heavy, silvery white, radioactive metal. In air, the metal becomes coated with a layer of oxide that will make it appear from a golden-yellow color to almost black. Uranium is an alpha emitter.

Warhead. That part of a missile, projectile, torpedo, rocket, or other munition which contains either the nuclear or thermonuclear system, high explosive system, chemical or biological agents, or inert materials intended to inflict damage.

Warhead Section (WHS). A completely assembled warhead including appropriate skin sections and related components.

Weapon Debris (nuclear). The residue of a nuclear weapon after it has exploded or burned; that is, the materials used for the casing, and other components of the weapon, plus unexpended plutonium or uranium, together with fission products, if any.

Weapons Recovery. Includes a comprehensive assessment of the accident, neutralizing the weapon hazards, and removing, packaging, and shipping of the weapon hazards.